

**Bear Gulch Cave Management Plan  
Environmental Assessment**

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## INTRODUCTION

Pinnacles National Monument (PNM) was established by President Theodore Roosevelt in 1908 to protect for its scientific interest the natural formations known as the Pinnacles Rocks under Department of Agriculture's administration. Transferred to the Department of the Interior in 1910, PNM came under the National Park Service (NPS) when the Service was created by the Organic Act of 1916. The purpose of the National Park Service is to conserve natural and cultural resources and provide for public enjoyment of these resources in such a way as to leave them unimpaired for the benefit of future generations. Approximately 12,500 acres of PNM's 24,000 acres is designated wilderness, with an additional 15% of the land designated as potential wilderness. PNM preserves a unique mixture of volcanic pinnacle formations and the best example of a coastal broadleaf chaparral ecosystem found in the National Park Service. The Pinnacles are the remains of a 23 million-year-old Miocene volcano, and PNM contains some of the best representations of talus caves in North America. The landscape is in constant change and demonstrates the effects of weathering, block faulting, frequent earthquakes, fire, and flooding. PNM contains numerous archeological, historical, and architectural resources.

It was local ranchers taking visitors on tours of the caves that brought this area to the attention of President Theodore Roosevelt and led to the monument's establishment. The continued visitor use of the caves is an important traditional use that originally contributed to the establishment of the monument. This document is a culmination of six public scoping meetings, 88 written public comments, and consultations with federal agencies, state agencies, bat researchers and cave experts. This will be a living document that will be reviewed on an annual basis. This annual review process will ensure that the management of the Bear Gulch Cave remains flexible and able to respond to changing conditions and use patterns and to changes in statutes and regulations.

## PURPOSE AND NEED FOR THE ACTION

The National Park Service proposes to change historic visitor use patterns of the Bear Gulch Cave at Pinnacles National Monument, San Benito County, California (see Regional and Area Maps 1 and 2). The purpose and need for this action is to protect a colony of Townsend's Big-eared Bats (*Corynorhinus townsendii*) and provide cave access to visitors. Upon the discovery of this colony, the cave was temporarily closed from June to October 1997 to protect this extremely sensitive species. Upon the recommendations of several bat biologists (Appendix A), the superintendent closed the cave for a four-year study that began September 1998. The purpose of this closure was to evaluate bat usage of the cave to determine whether it would be possible to allow visitor use of the cave while protecting this bat species. As of 2002, the biological data has been collected for a sufficient period to make an informed decision on how best to manage this cave. The Bear Gulch Cave is critical not only to the survival of this bat colony, but potentially to the continued existence of the entire species. The Bear Gulch Cave is also a primary visitor attraction and important cultural resource, and the protection of the caves for scientific and scenic values is specifically mentioned in PNM's enabling legislation of 1908.

## AFFECTED ENVIRONMENT

### Townsend's Big-eared Bats

Townsend's Big-eared Bats (*Corynorhinus townsendii*, TBB) are medium-sized, light brown bats with very large ears. They specialize in eating moths and can travel up to 10 miles during a single evening of hunting. They occur throughout the West and use a variety of habitats. Finding TBB is strongly dependent upon caves or cave-like roosting areas. They prefer open roosting areas in large rooms and do not tuck themselves into cracks and crevices like many bat species do. Their preference for open spaces in caves makes them easy to detect and vulnerable to vandalism and human disturbance (*Pierson et al 1999*).

Summer maternity colonies range in size from a few dozen to hundreds of individuals. These colonies form between March and June (depending upon climate and geography), with pups born between May and July. Maternity colonies choose caves that have warm, stable temperatures in which to rear their pups. Males remain solitary during the maternity season. Hibernating colonies are comprised of males and females and range in size from one to several hundred, sometimes thousands of bats. Hibernation sites are chosen based on cold, stable temperatures. TBB have a narrow range of temperatures for each season that they can occupy.

TBB are very sensitive to human disturbance. Researchers have documented that a single human entry into some colonies caused the bats to abandon the roost. However, not all colonies are that sensitive. Noise and flashlights disturb these bats, forcing them to abandon caves or to move to areas with less than optimal temperatures.

The California Department of Fish and Game sponsored a study on the status of TBB throughout the state. This study documented that populations of this species have declined significantly (>40-60%) in the past 30 years (*Pierson and Rainey 1996*). The three subspecies of TBB in the eastern US are all listed threatened or endangered species. Scientists believe that the two western subspecies should also be listed. Currently in California, TBB is a Species of Special Concern, the status below Threatened. National Park Service Guidelines (NPS 77) mandate that species of special concern be managed as if it was threatened or endangered.

In the 15 years prior to 1997, TBB had been seen in the Bear Gulch Cave, but only in small numbers. It is possible that this species occupied the cave for an even longer period, but PNM does not have any verifying documentation (observation cards or natural history reports). In 1997, a large maternity colony of TBB was discovered in the Bear Gulch Cave. PNM wildlife biologist began a monitoring protocol to document the population size and locations of the bats inside the cave. Park staff also began a temperature and humidity study of both caves (Bear Gulch and Balconies) to determine whether the caves had suitable habitat for bats. The Bear Gulch Cave was initially closed from June to October 1997 to protect this sensitive and declining species, while the Balconies Cave remained open for visitor use. In March 1998, PNM convened a panel of bat and cave experts to address the cave management issue. This panel recommended closing the cave for four years of study to determine whether the TBB behavior would change on an annual basis and to better understand the TBB colony in this particular cave. The superintendent authorized this closure and biological study, which is now being concluded.

The study of the bats and caves in PNM has provided data upon which to base park management decisions. When the colony was first discovered, park resource management staff was uncertain whether TBB and people both could use the cave. Biological data indicates that the entire cave cannot be opened for full-year visitor use without having negative impacts on TBB, but it suggests that full, year-round exclusion of visitors may not be needed to protect this colony. This study documented which portions of the cave the bats used during different seasons. It demonstrated that the colony uses the cave year round, with high numbers of TBB in the cave from April through September and again in November through February, and low numbers in October and March. Our discovery that this colony stays in the cave year round is unusual. Bats typically like warm caves for raising young and cold caves for hibernation. The Bear Gulch Cave is unique in its airflow and microclimates. This is one of a few caves with the preferred conditions for both maternity and hibernation. While the Bear Gulch Cave has several “ideal” temperature locations for bat roosting, the cave temperature modeling study indicates the Balconies Cave will not be occupied by numerous TBB for long periods of time due to the drastic fluctuation in daily temperatures.

A question has been raised about whether this colony was in the cave for several years, just tucked away from people out of sight or if they moved in from another cave. The answer to this question is not known. What is known is that people can affect this colony. TBB are using the cave differently now that there are no visitors going through the cave.

By limiting access, TBB chose the best spots to roost, rather than choosing spots to avoid people. Allowing TBB to roost in the best locations, over the long term, should make a more stable, successful colony.

The colony at PNM is vital to the long-term survival of this species. There are few records of maternity colonies of TBB in California and the Bear Gulch Cave colony is large for this species, currently estimated at >425 adult female bats (field data, summer 2002). This is the largest colony south of San Francisco. While 300 adults used to be the typical size of a TBB maternity colony, most colonies now consist of much smaller numbers (40-60 adult females). PNM has the largest known hibernaculum (~300 hibernating bats) south of Napa. Consequently, the population at PNM is extremely important for the survival of a species that is in decline. Since the cave closure, the colony has more than doubled in size. The closure has succeeded in protecting this resource as well as providing PNM the opportunity to better understand the resources involved.

### **Talus Caves**

In 1906, Pinnacles National Monument was first protected as a national forest reserve. Two years later, President Theodore Roosevelt decreed Pinnacles worthy of National Monument status to “protect the rocks and caves for their scientific and scenic values.” Talus caves, such as those found at PNM, are a rare cave form. Talus caves are formed either by large rocks slumping at the bottom of a mountainside or large rocks falling into a narrow slot canyon and filling it, like the caves at Pinnacles. Talus caves are forever in motion, in geologic time scales. The boulders will continue to move and the passages change. Due to the inherent nature of talus caves, there are multiple entrances and multiple openings in the ceiling (called skylights).

### **Visitor Use**

People have been visiting the Bear Gulch and Balconies Caves at PNM since before it was a monument. Local ranchers and landowners used to provide guided tours of the Balconies Cave before the turn of the twentieth century. While there are other talus caves in PNM, these cave systems are very short (less than 300 feet in length) and have been deemed not suitable for development (Joel Despain, Cave Specialist, Sequoia and Kings Canyon National Parks, pers. com.). The Bear Gulch and Balconies Caves are considered to be some of the best representations of talus cave in the United States and are considered to be nationally important. The typical caving activity includes hiking and climbing through small rock passages. While there are some areas of complete darkness in both developed caves, most of the caving at PNM has some amount of light filtering into the cave through its numerous skylights. No caving in PNM requires technical equipment or specific instruction. The majority of PNM visitors visit a cave during their stay at PNM. A good exploration of either cave would require 2-3 hour visit as they are relatively small in size (approximately 1500 feet).

For the first 35 years of PNM’s existence, the primary cave to visit was the Balconies Caves. The Bear Gulch Cave remained poorly developed and mostly unused. The Balconies Cave had a campground near its entrance, increasing its popularity. During this time, the Bear Gulch Cave had to be accessed from two different routes (north and south), and had a large deep crevasse separating the two trails in the middle of the cave. Because it was not a “through” cave, it tended to be less popular.

During the Great Depression, the Civilian Conservation Corps (CCC) had a crew deployed at Pinnacles worked to improve the trail system. Part of the CCC work was to make the Bear Gulch Cave more accessible, which was completed by 1935. Nevertheless, even with the improved access, the primary visitor attraction remained the Balconies Cave. It was not until the early 1970s that focus moved from the Balconies Cave towards the Bear Gulch Cave. This refocusing was primarily related to the Balconies Campground and Old Pinnacles Road being closed in the late 1960s and the increased development in the Bear Gulch Headquarters area. These two acts made access to the Balconies Caves more difficult from the east side of PNM and redirected visitors to Bear Gulch.

Following the general park use levels, the Bear Gulch and Balconies caves experience the heaviest use on weekends from February through June. Park visitation is relatively low during weekdays and during the summer, fall, and early winter. However, the visitors that do come to PNM during the summer heat, find a cool retreat in the caves. Likewise, during school holidays (spring, Thanksgiving, and winter breaks), there is an increase in visitation of the caves during the weekdays.

Hiking and rock climbing are the main recreational activities at PNM, but many visitors also come for picnicking, birding, and wildflower viewing. There are 32 miles of trails with the most popular destinations being the High Peaks, the Balconies Cave, and the Bear Gulch Reservoir. Nearly 6 million people live within a 100-mile radius of PNM and about 20 million within a 300-mile radius, making it easily accessible to people living in the major metropolitan centers of Los Angeles and the San Francisco Bay Area. Climbing is a historical use at PNM and continues to increase in popularity. The primary climbing areas are Discovery Wall to the Five Sisters and Elephant Rock to Machete Ridge. None of these are located within the Pinnacles Wilderness. There are numerous climbs in wilderness areas but due to the length of hiking required to each reach these area their use is relatively limited. There are no identified climbing routes near the proposed site.

Management of the Bear Gulch Cave has been minimal. Unlike many NPS units, there is no additional fee or permit required to enter the caves in PNM. Counting of the number of visitor using the caves only began in 1998. The cave has been open for public access for most of PNM's existence, although temporary closures have occurred for three reasons. First, a closure was put into effect in the early 1980's, when the US Geological Survey deemed the caves hazardous following a large earthquake. Both the Balconies and Bear Gulch caves were closed for 18 months. To block public entry, each cave had a permanent gate built at all trail entrances. Protocols were established for the temporary closure and reopening of the caves in response to earthquakes. Points in the caves were marked and the distances between them measured. Following large earthquakes, park staff re-measures these distances to check for boulder movement. If no movement has occurred, the caves remain open to the public. Second, short-term closures have been established associated with high water running over the caves' trails, which are generally in streambeds. These safety closures typically last a few days or weeks. The third type of closures the one currently in effect to protect the TBB colony and allow for research on TBB behavior and habitat use in the cave to determine how much visitor access will be possible.

All caves within the PNM boundary are protected by the Federal Caves Protection Act of 1988. This law requires all Federal Agencies to protect caves and their resources on the land the agencies manage. This law allows access to be limited to protect cave resources. Any decision made regarding the Bear Gulch Cave must comply with this law.

#### **Location of Project Site:**

Pinnacles National Monument (36° 28' 25" N, 121° 11' 25" W) is located in central California, approximately 150 miles south-southeast of San Francisco and 40 miles east of Monterey. PNM is nestled in the Gabilan Mountains between the Salinas and San Benito Valleys. The Gabilan Mountains are considered part of the inner Coast Range and a sub-range of the Diablo Mountains, which is located to the east of the monument. The climate is Mediterranean (hot, dry summers and cool, wet winters). PNM is approximately 24,000 acres.

PNM has two roads that provide access. The West Side of the monument is accessed via state route 146 from U.S. Highway 101 either from King City or Soledad. The East Side of the monument can be accessed via state route 146 from state route 25 either from Hollister, King City, or Coalinga. There is a three-mile gap between the ends of East and West 146, thus there is no connecting road through PNM.

Travel between the two sides is via hiking either up and over the central high peaks (4 miles, 2000 foot elevation gain) or through the Old Pinnacles Trail (3.3 miles, 250 foot elevation gain).

The project site (Map 2) is within and around the Bear Gulch Cave and is primarily accessed from the east side Visitor Center (via the Moses Spring Trail, approximately 2 miles round trip). Additionally, there is a second developed cave located in PNM. The Balconies Cave is located 4.5 miles from the Bear Gulch Cave. The Balconies Cave is easily accessed from the west side Visitor Contact Station (via the Balconies Caves Trail, approximately 2 miles round trip) or easily accessed from the east side from the Chalone Picnic Area (via the Old Pinnacles Trail, approximately 6.5 miles round trip). Both the Bear Gulch Cave and the Balconies Cave are talus caves, formed by large rocks falling into narrow slot canyons and filling them.

## **ISSUES AND IMPACT TOPICS**

### **Issues and Derivation of Impact Topics:**

Issues and concerns affecting this proposal were identified from a series of public scoping meeting, past NPS planning efforts, consultation with environmental groups, and input from state and other federal agencies. Issues raised by the public centered around a desire to retain access to the cave and an interest in protecting the bats. The major issues to be addressed in this document are: effects on visitor recreational use and experience; cultural resources (historic and archeological); biotic communities; species of special concern; unique ecosystems; geological resources (rocks and streambeds); stream flow characteristics; seismicity; air quality; water quality; floodplains and wetlands and wilderness values (viewshed).

Specific impact topics were developed for discussion focus, and to allow comparison of the environmental consequences of each alternative. These impact topics were identified based on federal laws, regulations, and Executive Orders; NPS Management Policies (2001); and NPS knowledge of limited or easily impacted resources. A brief rationale for the selection of each impact topic is given below, as well as the rationale for dismissing specific topics from further consideration. This proposal is consistent with the PNM Master Plan (1975), the East unit DCP (1993), and the Federal Cave Protection Act (1988).

### **Impact Topics Included in this Document:**

Vegetation: NPS policy is to protect the natural abundance and diversity of PNM's natural communities. Vegetation is affected in some of the alternatives, therefore vegetation will be addressed as an impact topic.

Fauna: The only wildlife resources in the cave affected by the proposed action are the bats, which are addressed in the special status species section.

Unique Ecosystems: As directed by the Federal Cave Protection Act of 1988, caves and their environments are unique and are in need of special protection. Since all alternatives would involve manipulation of the Bear Gulch Cave, the unique cave ecosystem will be addressed as an impact topic in this document.

Special Status Species: This section will address all threatened or endangered species (Federal and State Listed), species of special concern as identified by the California Department of Fish and Game, and rare species. The 1973 Endangered Species Act, as amended, requires an examination of impacts to all federally listed threatened or endangered species. NPS guidelines (NPS 77) instruct all units to treat species of special concern or rare species as if protected by the Endangered Species Act.

The United States Fish and Wildlife Service (USFWS) lists 15 special status species that occur within San Benito County and may be within the project area (Appendix B). Research conducted by monument staff and further consultation with the USFWS has demonstrated that none of the listed species are likely to range within the project area and that potential effects to listed species is highly unlikely. The California Department of Fish and Game lists 21 species of special concern that occur within San Benito County and may be within the project area (Appendix B). Research conducted by monument staff has demonstrated that only one of these species is in the project area (the Townsend's big-eared bat) and this bat has the potential of being affected by the project. In fact, this species is the reason for the need of a management decision. Therefore, special status species will be addressed as an impact topic in this document.

Geologic Resources – Rocks and Streams: Some of the alternatives include the construction of gates that have the potential of affecting the rocks and rock structure. One of these gates has the potential to affect the streambed and stream flow characteristics of Bear Creek. Therefore, geologic resources will be addressed as an impact topic in this document.

Wilderness Values (Viewshed): Legislation in 1978 created a 12,952-acre wilderness and 325-acre potential wilderness within PNM. In January 2000, approximately 8,000 acres of Bureau of Land Management lands were transferred to the NPS. In these lands were approximately 2,250 acres of wilderness study areas which must be treated as if it was designated wilderness. Some alternatives being considered would alter historic visitor use patterns. Visitors could be redirected to wilderness areas, which could create a potential impact to the wilderness. Therefore, wilderness will be addressed as an impact topic.

Cultural Resources: The *Statement for Management, Pinnacles National Monument*, 1980, indicates that there are no known ethnographic resources at PNM. The *Final Master Plan, Pinnacles National Monument*, 1975, indicates that there are no known archeological resources within the proposed project area. An NPS archeologist surveyed the proposed project site and found no evidence of pre-historic cultural resources. Although no artifacts are expected in the work site, all workers would be informed of the penalties for illegally collecting artifacts or intentionally damaging any archeological or historic property. Workers would be trained to recognize artifacts common to the area. Workers will also be informed of the correct procedures in case previously unknown resources are uncovered during construction activities. Prehistoric occupations appear to have been rare in this area, making discovery of non-funerary objects such as any prehistoric objects (general archeological or paleontological resources) unlikely. The prehistoric sites located within PNM do represent a seasonal or less frequent usage of the area. PNM probably was used as a travel corridor between the coastal areas and Central Valley. Should unknown resources be uncovered during construction, work would be stopped in the discovery area and the NPS would follow all regulations and, as appropriate, provisions of the Native American Graves Protection and Repatriation Act of 1990. Therefore, pre-historic cultural resources are dismissed as an impact topic in this document.

The Bear Gulch Trail is on PNM's List of Classified Structures (LCS) and Cultural Landscape Level 0 Inventory (CLI). Access to this cave was limited, until the 1930s, when the Civilian Conservation Corp did substantial trail construction within the cave, including several sets of trails and 3 bridges. This trail has been maintained to accurate CCC construction and appearance; it is considered to contain historically significant features. Some alternatives being considered would require the construction of a gate along the trail potentially affecting this cultural resource. Additionally, the Bear Gulch Cave is reputed to have been the hideout of Tibercio Vasquez; a local bandito with ties to the folklore tales of Zorro. Therefore, historic cultural resources will be addressed as an impact topic.

Visitor Recreational Use and Experience: The implemented alternative of this plan will determine type and amount of visitor access. Under the Organic Act of 1916, the National Park Service is directed to provide visitor enjoyment of the resources in such a way as to leave the resources unimpaired for future generations. Since all alternatives but the No Action alternative would alter historical visitor use patterns of this park feature, visitor use and experience will be addressed as an impact topic in this document.

Water Quality:

**Section 404:** The U.S. Army Corps of Engineers (COE) issues permits for work affecting wetlands and navigable waters of the United States as defined in Section 404 of the Clean Water Act (33 USC 1344) and Section 10 of the Rivers and Harbors Act of 1899 (33 USC 401 et seq.). This project falls outside the COE jurisdiction for the following reasons. First, the section of stream where the construction activities identified in Alternatives C and D are associated with a subterranean stream, not surface water. Second, these potential actions fall below the threshold of work for Nationwide Permitting. Third, the potential project site is above the mean high water mark. Therefore, the NPS will not need to obtain a 404 permit prior to implementing the selected action.

**Section 401:** The project requires compliance with General Condition 9 (water quality, Section 401 of the Clean Water Act) of the COE Nationwide Permit process. Clean Water Act section 401 certification or waiver of certification would be obtained through the California Central Coast Regional Water Quality Control Board, San Luis Obispo, California, prior to construction.

Throughout all aspects of the project, Bear Creek water quality would be maintained at or above minimum levels required by the State of California Water Quality Control Board. Water quality will be addressed as an impact topic in this document.

**Impact Topics Dismissed from Further Analysis:**

Seismicity: PNM is near the boundary of the Pacific and North American tectonic plates. The San Andreas Fault is within 9.6 km to the east; the maximum earthquake prediction for this portion of the San Andreas Fault is 6.5 on the Richter scale. The Bear Valley fault is within 6.4 km to the east; the Pinnacles Fault is within 4.0 km to the west; the Chalone Creek fault runs roughly parallel to Chalone Creek within 2.0 km to the north of the project site. These faults are active and can produce seismic activity (earthquakes) at any time – the region is notorious for earthquakes.

In an earthquake, the entire cave system is potentially dangerous. On a geologic time scale, the boulders that form the roof and walls of PNM's caves are in motion. Currently, there is a monitoring protocol in place to assess movement of cave rocks related to earthquakes larger than 4.0 on the Richter scale. The new gates identified in Alternatives C and D would not decrease the long-term stability of the cave's rocks. There are no gate construction guidelines related to increasing earthquake survivability. The addition of gates to the cave would not increase the risk of human death or injury related to earthquakes above that which exists in the unmodified condition. Therefore, seismicity is dismissed as an impact topic in this document.

Air Quality: The 1963 Clean Air Act, as amended, requires federal land managers to protect monument air quality, while the NPS Management Policies address the need to analyze air quality during park planning. PNM is a Class I Airshed. In Class I Airsheds, even a minimal change in air quality is considered significant. Should Alternative C or D be selected, local air quality would be temporarily affected by dust during the construction of the new trail and new gates. People or stock animals would be used to haul material to the work site. Therefore, an increase vehicle exhaust and emissions is not expected. Only minimal dust would be created, since trail construction would be by hand, thus loading rates are expected to be far below a significant level.



Any potential effects would last only as long as construction activities occurred, an estimated 2 weeks, and PNM's Class I air quality would not be affected by the proposal.

A concern was raised regarding potential changes in visitor use patterns potentially increasing air pollution due to increased visitors during currently low visitations times (e.g. October). PNM physical scientist analyzed the maximized projected change in visitation (based upon current parking space availability). Staff concluded that there would be approximately 1.4% increase in visitor vehicle emissions which represents an insignificant increase when combined with the much larger urban contributions (Appendix C). Therefore any alternatives currently being considered would not affect PNM's air quality and this issue is dismissed from future analysis.

Other Topics: The Council of Environmental Quality established impacts topics that must be considered in all NEPA documents.

These mandatory topics are: possible conflicts with the proposal and previous plans and policies; energy requirements and conservation; natural or depletable resources; urban quality; social or economically disadvantaged populations; wetlands and floodplains; prime agricultural lands; wild and scenic rivers and ecologically critical areas; sacred sites and Indian Trust resources; and public health and safety. Each of these topics was analyzed related to the potential alternatives. Each was dismissed because of lack of relevance to and/or lack of impact from the proposed project.

## **ALTERNATIVES**

### **Introduction**

The alternative section describes five management alternatives for this project. These alternatives were developed after public scoping sessions to resolve pertinent visitor use and natural resource management issues.

The no action alternative (*Alternative A*) describes the action of allowing visitor access to the full cave all year. The no action alternative provides a basis for comparing the management direction and environmental consequences of the alternative actions. The environmentally preferred alternative is *Alternative E – Full Protection of the Bat Colony*. *Alternative E* has no impacts to the cave, geology, wildlife, or plants in PNM but does affect visitor use and enjoyment. The NPS preferred alternative is *Alternative D – Combined Access* and defines the rationale of this action in terms of resource protection and management, visitor use and experience, costs, and other applicable factors. This alternative provides substantial visitor access into the Bear Gulch Cave with minimal impacts to the cave, geology, wildlife, and plants. The level of impacts associated with *Alternative D* is not expected to be significant. Established monitoring protocols will be continued under any scenario to ensure that no impairment is occurring as a result of management actions. All actions described in the proposed action are consistent with the approved 1975 Master Plan, 1993 East unit DCP, and related monument documents.

A summary table comparing the environmental consequences of each alternative is presented at the end of the alternatives section.

### **Goals Common to All**

The primary goals of this management plan are to protect the colony of Townsend's Big-eared Bats within the Bear Gulch Cave, preserve the cultural resources in the cave, and provide visitor access to the Bear Gulch Cave. The secondary goal is to continue the established monitoring protocol to build a foundation of basic scientific data and information from which sound management decisions will continue to be made. Additionally, this management plan will identify the criteria that will allow visitor use of the cave and the circumstances under which visitor access of the cave may be curtailed.

### **Alternative A**

Because the current cave closure is a temporary management tool to study management options, a no action alternative would return the Bear Gulch Cave to its historic visitor use – year round access to the entire cave system. The data collected from June 1997 through December 2001 indicates that this alternative would negatively affect the Townsend's Big-eared Bat colony. Allowing people year-round, full access of the cave would push bats into areas of the cave with sub-optimal temperature ranges. This would ultimately affect the survival of individual pups. Any decrease in pup recruitment would cause the colony to decline in numbers, threatening its continued existence. The Organic Act of 1916 directs the National Park Service to provide for visitor enjoyment in a manner that does not cause impairment of those resources. The expected decline in colony number, based upon the 1997-2002 data, could result in impairment. Additionally, the Organic Act mandates the National Park Service to conserve the wildlife within its boundaries; management actions leading to a decline in colony size would fail to conserve a species whose decline has been documented nationwide. The anticipated decline in colony size related to full cave access by visitors would be placing this species in a further imperiled condition and would be considered an impairment to PNM's natural resources (the colony of bats).

### **Alternative B**

This alternative allows visitors full access to the cave for very short periods, during the transition between winter hibernation and summer maternity colonies. This option would require a park wildlife biologist to monitor the cave, determine when the bat colony is in transition, and open the gates. Visitors would have unrestricted access for a maximum of 3-4 weeks in early fall (October) and 3-4 weeks in mid-spring (March), for a total of 6-8 weeks maximum of access each year. There is the chance that the transition periods could be shorter related to changes in weather, with the minimum access time being 2 weeks (one week in October and one week in March). Park biologists would continue to monitor bat activity during the visitation and monitor for the change from a transition period to either hibernation or maternity colonies, and would close the gates at appropriate times. This alternative would not require a change of trail structure, the construction of new trails or new bat gates.

This alternative would allow full access to the CCC constructed trail and would not alter the historical integrity of this work. Additionally this would allow visitors access into the Robber's Room, the reported hideout of Tibercio Vasquez, a locally culturally and historically significant figure. This alternative would not require additional park staffing or funding. If chosen, this alternative could be implemented immediately. However, because the opening time would be so limited, there is concern that the cave would be inundated with visitors during open access periods. A large increase in visitors in such a confined space could negatively impact the visitors' caving experience, potentially create unsafe conditions, and likely impact cave resources (other than the bats). This alternative would not lead to impairment.

### **Alternative C**

This alternative allows visitor access only to the lower two-thirds of the Bear Gulch Cave for the majority of the year, July 15 through May 15, a total of 44 weeks of access each year. The entire cave would be closed May 15 through July 15 due to the maternity colony using the lower portion of the cave for initial colony clustering and pupping, a very sensitive time in the bats' annual cycle. This alternative would allow visitors only partial access to the cave, with the upper one-third of the cave remaining closed indefinitely. Thus, visitors would only have partial access to the CCC constructed trail and would not have access to the Robber's Room. PNM wildlife biologist would continue to monitor the health and activities of the bat colony, and no additional funding or staff time would be required for implementation of this alternative. This alternative allows access for the majority of the year, so visitation could be spread out, and an inundation of visitors in short periods and the negative consequences of such visitor use are not expected.

This alternative would require some amount of new construction – two new gates and a new segment of trail (Map 3 and Figure 1). One gate would be on the north side of the Robber’s Room, to prevent access to the upper one third of the cave. The second gate would be a side gate leading out of the cave to the new trail segment. This gate would be needed to close access to the lower portion of the cave during early maternity season. The new trail would connect into the Moses’ Spring Trail, just below the Monolith. This trail would be approximately 200 feet long and would require minimum brush clearing and soil disturbance. The trail would require a section of grate to provide a floor across a small crevasse and a small set of stairs to exit the cave. The gates and grate flooring would require drilling holes into rocks, but would not require any change in the historical trail structures. The gates would be placed to have minimal, if any, affect the viewshed of the cave waterfalls. This construction will require additional funding to implement and thus could not be immediately implemented; funding would need to be secured. There would be a one-time cost of \$45,000. This alternative would not lead to impairment.

#### **Alternative D**

This alternative combines Alternative B and C to provide maximum visitor access, while providing necessary bat protection and is the NPS preferred alternative. This alternative would allow visitor access to the lower two-thirds of the Bear Gulch Cave for the majority of the year, July 15<sup>th</sup> through May 15<sup>th</sup> (44 weeks). Visitors would have unrestricted access during the transition periods for a maximum 3-4 weeks in early fall (October) and 3-4 weeks in mid spring (March), for a total of 6-8 weeks maximum of full cave access each year. As in Alternative B, there is the chance that the transition periods could be shorter related to changes in weather, with the minimum access time being 2 weeks (one week in October and one week in March). The entire cave would be closed May 15<sup>th</sup> through July 15<sup>th</sup> due to the maternity colony using the lower portion of the cave for initial colony clustering and pupping, a very sensitive time in the bats’ annual cycle.

Because this alternative would allow for the most visitor access and potentially have some impact to the bats, PNM wildlife biologist would continue to monitor the health and activities of the bat colony, following the protocols that have been used for the past four years of study. This alternative would allow full access to the CCC constructed trail and access into the Robber’s Room, allowing the cultural aspects of the cave to be fully enjoyed for a portion of the year. This alternative allows for access the majority of the year, so an inundation of visitors in short periods and the negative consequences of such visitor use are not expected. As documented in Alternative C, new construction – two new gates and a new segment of trail – would be required (Map 3 and Figure 1). This construction will require additional funding to fully implement. PNM management could partially implement this plan immediately (full access for short periods as in Alternative B), while funding is secured for the longer-term access in the lower two-thirds of the cave. There would be a one-time cost of \$45,000 for this alternative. This alternative would not lead to impairment.

#### **Alternative E**

This alternative would close the Bear Gulch Cave to visitor use indefinitely. Information gathered about other colonies of Townsend’s Big-eared Bats originally led park management to believe that a full cave closure, as proposed in this alternative, would be the only viable management option able to protect PNM’s colony. Data collected from June 1997 through August 2002 in this cave indicates that this colony is not as sensitive as other TBB colonies and that some human activity may not be detrimental to its continued existence. However, several bat specialists have expressed concerns about the continued success of this colony and the likelihood that allowing even limited visitor access could negatively affect this colony. Considering how imperiled this species is throughout its range, keeping the Bear Gulch Cave closed to all visitor access is the best means for assuring this colony’s health and the ultimate survival of the species.

Under this alternative, there would be no visitor access to the Bear Gulch Cave. Caving opportunities in PNM would still exist in the Balconies Cave. PNM wildlife biologist would continue to monitor the health and activities of the bat colony, following the protocols that have been used for the past three years of study. This alternative would not allow access to the CCC constructed trail or access into the Robber's Room. This alternative would preclude a potential visitor experience of one of the important cultural aspects of PNM. No new construction or additional funding would be required for this alternative, and it could be implemented immediately. Because Alternative E would offer the greatest protection to the TBB colony, it is the environmentally preferred alternative. This alternative would not lead to impairment.

### **Alternatives Considered and Dismissed**

In assessing how to logistically implement a partial cave opening, the removal of a CCC bridge inside the cave was considered. This alternative was rejected because of the impact to the cultural resources of the cave and the increased visitor safety hazard resulting from two-way traffic on an extremely narrow set of stairs. Likewise, the alternative of constructing a single gate midway through the cave without a new trail reroute was considered. While this alternative did not require the destruction of any cultural features in the cave, it did still require two-way traffic on a narrow set of stairs. Forcing this traffic pattern was considered unsafe for the anticipated visitor use levels, and this alternative was dismissed.

In public scoping, PNM asked visitors to assess several cave management possibilities; one of those was the use of guided tours. Several people expressed interest in having a guided tour and that having a ranger guide was the best noise control option.

However, most people expressed the sentiment that Pinnacles National Monument is one of the few places where visitors can experience a cave on their own time schedule with their own sense of adventure. The park's current staff levels could not support guided tours; it was estimated that four additional rangers would be needed to implement tours at an annual cost of \$125,000. Consequently, this alternative would require a substantial increase in park base funding that might take many years to secure. For these reasons, this alternative is not being considered here, but rather would be considered in the future General Management Plan. Park staff is assessing the possibility of providing a guided walk or a self-guided trail booklet as an option, but not a requirement for entering the cave.

Public scoping on this issue suggested a variety of educational opportunities for visitors, such as cameras in the cave allowing remote viewing of the bat colony, a virtual tour of the caves via the web or CD-ROM, and bat viewing opportunities at dusk. The public expressed much interest in these options, but it was clear that citizens did not want these kinds of opportunities to replace an actual visit to the cave. Opportunities to expend interpretation of the caves in the park are being considered and will be evaluated separately, and will incorporate all public comments related to interpretation and education in the Bear Gulch Cave.

## Summary of Environmental Consequences of the Alternatives

<b>Impact Issues</b>	<b>Alternative A</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D</b>	<b>Alternative E</b>
<b>Vegetation</b>	No Impact	No Impact	Remove 6 bushes and 1 tree.	Remove 6 bushes and 1 tree.	No Impact
<b>Unique Ecosystems</b>	No Impact	No Impact	Two new gates installed in cave.	Two new gates installed in cave.	No Impact
<b>Special Status Species</b>	Expected decline in bat population due to human disturbance. Potential impairment of this colony affecting survivability of the species.	No impact expected. Bats will be monitored to assess potential impacts and visitor access decreased if impact found.	No impact expected. Bats will be monitored to assess potential impacts and visitor access decreased if impact found.	No impact expected. Bats will be monitored to assess potential impacts and visitor access decreased if impact found.	No Impact, bat colony fully protected
<b>Geologic Resources: Rocks and Streams</b>	No Impact	No Impact	Gates will require bolting into rocks, potentially changing rock weathering. Gates potentially affect high water flow.	Gates will require bolting into rocks, potentially changing rock weathering. Gates potentially affect high water flow.	No Impact
<b>Wilderness</b>	No Impact	No Impact	No Impact	No Impact	No Impact
<b>Cultural Resources</b>	No Impact	No Impact	Bolting into trail tread required. Gate designed to not affect historic handrail. Visual affects due to new gate.	Bolting into trail tread required. Gate designed to not affect historic handrail. Visual affects due to new gate.	No Impact
<b>Visitor Recreation Use and Experience</b>	Visitor access year-round into the cave. Impacts on bat evening programs expected due to decreased colony in cave.	Visitor access of entire cave for 2-8 weeks, cave closed 44 to 50 weeks each year, depending upon biological monitoring.	Visitor access to lower 2/3 cave for 44 weeks each year, cave closed for 8 weeks each year, potentially more depending upon biological monitoring.	Visitor access of entire cave for 2-8 weeks, access to lower portion of cave for 44 weeks each year, cave closed for 8 weeks each year, potentially more depending upon biological monitoring.	No visitor access to Bear Gulch Cave, expect to increase interpretation of the cave.

Impact Issues	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
<b>Water Quality</b>	No Impact	No Impact	New trail construction may generate sediment in the stream the first year following construction.	New trail construction may generate sediment in the stream the first year following construction.	No Impact
<b>Cumulative Effects</b>	Potential decline in TBB population viability throughout Central California.	None	None	None	None

## ENVIRONMENTAL CONSEQUENCES

The following section identifies the environmental impacts associated with the proposed alternatives. Associated with each impact issue is a classification of the impact. No impact means the alternative would not have any measurable effect to the identified resource. Negligible impact implies the alternative would have an effect that could be measured but would not have any meaningful effect on the resource. An example of a negligible impact would be trimming a few branches off a tree. Minor impacts can be measured and are meaningful, but are small in scale, both in time and area. Typically, small time scales would be less than 4 weeks. A small area would be less than 10 acres or less than 10% of the resource, if that resource occupies less than 10 acres within the monument. Minor impacts are of short duration and small scope, and the timing and placement does not overlap sensitive times (e.g. breeding season for an animal or times of water flow for streams) or sensitive places (e.g. nest area or wetland). Moderate impacts begin to affect larger processes and are typically larger in scale, either in time (up to 4 years) and/or in space (10 to 100 acres or 10 to 30% of the resource) or affect sensitive times. Major impacts affect the larger processes, have a large scale (more than 100 acres or 31% of the resource) and last for a long time (more than 4 years after the project is complete) and overlap sensitive aspects for the resource. Impacts are classified as impairment if in the long-term the action would prevent the process from behaving naturally and would lead to degradation of the resource under evaluation. The Organic Act of 1916 prohibits the National Park Service from implementing any action that causes impairment.

Impacts are identified on two time scales – short and long term. Short-term impacts occur during the active portion of the alternative (e.g. during the construction period). Short-term impacts are either self-eliminating (e.g. there is no dust created as soon as construction is completed) or can be corrected shortly thereafter by mitigation (e.g. trees were removed for construction, but replacement trees were planted and would restore the area in the long-term). Long-term impacts typically begin once the active project is complete (e.g., the construction of a new parking lot would in the long-term increase visitor use). Long-term impacts continue past the active portion of the alternative for at least the foreseeable future, 15-20 years, and potentially longer. If the alternative established an activity that would continue for the foreseeable future (e.g. the creation of a permit system), then the impacts of the active portion would be considered in long-term impacts as well as short-term impacts.

**Background:** The data collected over the past four years clearly indicates that allowing people in all parts of the Bear Gulch Cave, for the entire year, would be detrimental to this colony of TBB. PNM would not be able to protect the caves and their resources for their scientific and scenic values in

perpetuity as directed by the Organic Act of 1916, PNM enabling legislation, and the Federal Cave Protection Act of 1988. The Townsend's Big-eared Bat is one of the cave resources, and it must be protected. However, The Organic Act also directs parks and monuments to provide for visitor enjoyment in such a way as to not impair the resources. Park data seems to indicate that portions of the cave may be able to be opened for portions of the year, with minimal or no impact to the bats. The options of visitor access are identified in this environmental assessment and the potential impacts addressed.

Park staff will review this document each year. The health of the bat colony will be assessed each year through ongoing surveys of population size and roost locations. If existing conditions change; for example if the bat is listed as a threatened or endangered species, the bat appears to no longer occupy this cave, or there is a significant change in the population size or location; then the review process would include interested agencies, including the California Department of Fish and Game and U.S. Fish and Wildlife Service. Likewise, organizations such as the Center for Biological Diversity, National Speleological Society, local and regional grottos, and Bat Conservation International would be consulted. If in these consultations it appears that there would need to be a significant change in the current management of the cave and the bats, NPS would conduct public meetings to gather public input on the management issues.

### **Alternative A**

Alternative A allows for year-round visitor access of the cave and is the no action alternative.

Vegetation: This alternative would have no impact to vegetation.

Unique Ecosystems: This alternative would have no impact on the unique ecosystem of the cave.

Special Status Species: Full access to the caves is likely to cause a decline in the TBB population due to human disturbance. Subsequently, this alternative is expected to have a major impact on the special status species. Data clearly indicates that with people in the cave, TBB move higher into the rocks and out of the lower areas, which have the species' preferred temperature/humidity conditions. Due to the energetic issue associated with maintaining body temperature and growth, it is expected that mortality rates of juvenile and adult bats would increase, resulting in a decrease of the colony size. This impact would be long-term and would likely lead to impairment of this natural resource.

There is still debate on whether this colony of bats has occupied the cave for a long time or whether they are a recent addition. Assuming that the colony has been present for a long period of time, it is highly likely that the previous visitor use patterns (full access to the cave) was causing a negative cumulative impact to this colony. This assumption is based upon the growth of the colony documented through the 4-year study period, while the cave was closed to visitation and the colony showed increases in population size equal to estimated maximum reproduction rates. This would seem to indicate that if the colony has been resident in the cave for numerous years, visitor use was affecting recruitment rates and thus influencing the survivability of the colony. There would be no means with which to mitigate the negative effects of this alternative and maintain full cave access.

Geologic Resources – Rocks and Streams: This alternative would have no new impacts associated with geologic resources.

Wilderness: This alternative would have no impact associated with wilderness issues.

Cultural Resources: This alternative would have no impact associated with cultural resources.

Visitor Recreation Use and Experience: This alternative would have no impact associated with visitor recreation use of the cave. However, there would be an associated impact on visitor experience and other recreational use. Over the past 4 years, park staff has provided a variety of evening programs on bats. These programs have include night hikes featuring listening to and watching bats and viewing a bat emergence followed by the bats feeding and drinking at the reservoir. Both of these programs involved TBB. As identified above, this alternative would result in the TBB colony decreasing which would negatively affect these visitor recreational activities. Additionally, visitors have expressed an understanding that their experience at Pinnacles is enhanced by knowing that this colony exists and is protected. Parking facilities are overtaxed even with the closure of the cave over the last four years. Visitation is limited by the existing parking, and opening the cave would not contribute to increased impacts to visitors. Allowing for year-round cave access would be a minor, long-term impact to visitor recreation and experience.

Water Quality: This alternative would not impact water quality.

Cumulative Effects: TBB are declining throughout California. This full-access alternative would likely contribute to the decline of TBB within the park through continued disturbance in the caves. This would likely threaten the long-term viability of this species throughout Central California.

### **Alternative B**

This alternative allows for access to the cave during transition periods (October and March) and would allow for a minimum of 2 weeks access and a maximum of 8 weeks of access.

Vegetation: This alternative would have no impact to vegetation.

Unique Ecosystems: This alternative would have no impact on the unique ecosystem of the cave.

Special Status Species: This alternative would potentially have an impact upon the TBB colony. Transition periods are the time of year that the bats are least sensitive to human disturbance energetically. Additionally, data clearly indicates that the population of TBB drastically decreases in size during these times. (We are uncertain where the TBB go.) If any visitor use during this period affected the TBB, it would only be a few individuals (<30 bats). It is expected that any impact from this alternative would be minimal and not considered significant due to the timing in the bat's annual cycle and the number of affected individuals.

Monthly monitoring of the bats would continue. Data including bat locations, bat numbers, bat activity levels, and people activity levels would be recorded. This new data would be compared to the baseline data collected over the past 3-4 years. If the new data indicate that bats are behaving as they have for the past 4 years (the expected results), visitor access would continue as planned. However, if the new data indicate that people were disturbing the bats, the visitor access would be decreased (and potentially stopped) until the bats behave as they did during the 4-year study period (bat locations and bat activity). Bat disturbance would be defined by the following criteria: changes in roost locations, decreases in bat numbers, and increases in bat activity (especially during the daylight hours). Following this mitigation may lead to very limited access of the cave (approximately 1-week in October and March), but this is not expected at this time. This alternative would have negligible, long-term impacts and would not lead to impairment.

Geologic Resources – Rocks and Streams: This alternative would have no new impacts associated with geologic resources.



Wilderness: Based upon 2 years of data collected during the current cave closure, the visitor use of wilderness areas did not exceed visitor levels that would impact the quiet and solitude qualities of wilderness (as defined in the 1997 Draft Wilderness Management Plan). Considering this alternative would allow for some visitor use of the cave, visitor use of wilderness areas would be even less than during the study period. Therefore, this alternative is expected to have no impact to wilderness experiences or values and will not lead to impairment.

Cultural Resources: This alternative would have no impacts associated with cultural resources.

Visitor Recreation Use and Experience: This alternative would have impacts to visitor recreation use and experience as compared to recent historic usage (1966-1997). Instead of having access to the cave 52 weeks a year, this alternative allows for 2-8 weeks of access a year, depending upon the bat annual cycle and influences of a given year's weather.

This alternative allows visitor access to the entire cave for brief periods, thus allowing the complete cultural and historic elements of the cave to be experienced. This option would meet visitor needs by allowing them to plan for the brief open periods. However, if data collected from new bat surveys indicate that people were disturbing the bats, the visitor access would be decreased until the bats behave as they did during the 4-year study period (bat locations and bat activity). PNM would advertise when the cave would be opened on the voicemail system (831-389-4485), park webpage ([www.nps.gov/pinn](http://www.nps.gov/pinn)), and other communications means. However, due to the variability in weather and bat timing from year to year, the open periods could not be announced very far in advance. Due to the very short open periods, access for remote visitors would be more difficult. However, the Balconies Caves would be open and accessible year-round, so a caving opportunity would be always be available. This alternative would allow for a healthy TBB colony. Thus, the evening programs focusing on bats (night hikes and bat viewing) could still provide visitor use and enjoyment. Additionally, the visitor experience of knowing that this colony exists and is protected would remain intact. Parking facilities are overtaxed even with the closure of the cave over the last four years. Visitation is limited by the existing parking, and opening the cave would not contribute to increased impacts to visitors. This alternative would have a moderate, long-term impact to visitor recreation and experience.

Water Quality: This alternative would not impact water quality.

Cumulative Effects: TBB are declining throughout California. This alternative would not likely contribute to the decline of TBB within the park as access to the cave is limited. This would not likely threaten the long-term viability of this species throughout Central California.

### **Alternative C**

This alternative allows visitors access to the lower two-thirds of the Bear Gulch Cave from July 15<sup>th</sup> through May 15<sup>th</sup>, a total of 44 weeks of access each year. The entire cave would be closed to visitor access from May 16<sup>th</sup> to July 14<sup>th</sup> each year to protect the maternity colony. This alternative requires the construction of two bat-friendly gates and a short connector trail.

Vegetation: This alternative requires the removal of 6 holly-leaved cherry bushes and 1 coast live oak (less than 6 inches in diameter) and would require trimming of several shrubs related to the new connector trail. This alternative has a negligible, long-term impact on this resource and is not likely to lead to impairment of the vegetation.

Unique Ecosystems: Some concern has been raised over installing additional gates and the potential effects on the cave environment. While it is true that gates can affect the internal climate of a cave with few entrances, the Bear Gulch Cave has numerous skylights and openings.

These gates will not affect the airflow, humidity, or other characteristics related to the cave's climate. This alternative has a negligible, long-term impact on this resource and is not likely to lead to impairment of the unique ecosystem.

Special Status Species: This alternative would potentially affect the TBB colony. Data from other colonies indicates that TBB can be sensitive to noise, and visitors in caves are inherently noisy. This alternative allows people in the cave during transition periods and hibernation. Transition periods are the time of year that the bats are least sensitive to human disturbance energetically. Additionally, data clearly indicates that the population of TBB drastically reduces in size during these times. If any visitor use during this period affected the TBB, it would be minor. However, the colony can be very sensitive during hibernation and during this period (late November through late February), the colony numbers are very high for this species (>250 individuals). There is a chance that noise from visitors in the lower portion of the cave will disturb the bats, potentially causing them to awaken, use valuable fat stores, and potentially starve to death due to decreased fat reserves. However, at this time monument staff expects no significant impact to the bat colony associated with this alternative.

Monthly monitoring of the bats would continue. Data – bat locations, bat numbers, bat activity levels, people activity levels—would continue to be recorded. This new data would be compared to the baseline data collected over the past 3-4 years. If the new data indicates that the bats are not affected by visitor use, this alternative would continue to be implemented fully as planned. If the new data indicates that the bats are disturbed by people and are positively correlated with people activity, the visitor access would be decreased (and potentially stopped) until the bats behave as they did during the 4-year study period (bat locations and bat activity). Bat disturbance would be defined by the following data: changes in roost locations, decreases in bat numbers, and increases in bat activity (especially during the daylight hours). Following this mitigation may lead to very limited access of the cave, temporarily, in addition to the spatially limited access. This alternative would have negligible, long-term impacts to the TBB and would not likely lead to impairment.

Geologic Resources – Rocks and Streams: The construction of two new gates in the cave and a short (~200 ft) connecting trail have the potential of affecting geologic resources. The bolting of the gates into rock has the potential to affect the long-term weathering of the rocks. The construction of the gates would be in the stream channel. These gates have the potential of affecting high water flows ultimately causing debris jams.

To mitigate for these potential impacts, any bolts placed into the rock would be completely sealed with epoxy, preventing the possibility of water entering the rock via the drilled holes. The lower portion of Gate 1 (Fig. 1) would be designed with a hinge. This hinge would allow for the lower portion of the gate to be raised during high water, to allow debris to pass. After each high-water event, PNM staff would enter the cave and clear any debris from the gate (moving it to the downstream side of the gate). These actions should minimize potential impacts well below the significance threshold. This alternative would have negligible, long-term impacts to the rocks and streams and would not likely lead to impairment.

Wilderness: Based upon 2 years of data collected during the current cave closure, the visitor use of wilderness areas did not exceed visitor levels that would impact the quiet and solitude qualities of wilderness (as defined in the 1997 Draft Wilderness Management Plan). Considering this alternative would allow for visitor use of the cave for the majority of the year, the visitor use of wilderness areas would be even less than during the study period. Therefore, this alternative is expected to have no impact to wilderness experiences or values and will not lead to impairment.

Cultural Resources: The gate construction would require some bolting into the trail bed. This bolting has the potential of affecting the historic integrity of the trail.

At the two points where the gates would be constructed, the trail bed is concrete. The holes would need to be drilled into the trail bed to secure the gates. In both gate areas, there is CCC constructed handrail. These handrails are considered contributing features to the cultural resource and need to be protected. Views within the cave would be impacted by the gate construction.

To mitigate these potential impacts, any holes drilled into the trail bed can be sealed with epoxy, preventing further deterioration. If at some point in the future the gates were to be removed, the holes in the floor could be patched, and there would be no visual or significant structural damage to this historic feature of the trail. The gates have been designed in such a way as to not require the handrails to be moved. Additionally, the gate construction would avoid the rails. There would be no impact to the rails. The gates would be placed in such a way as to minimize the visual intrusion of the structures and maintain, as much as possible, the historic viewshed within the chamber. With these mitigations, any potential impacts to cultural resources would be negligible and long-term but would not likely lead to impairment.

Visitor Recreation Use and Experience: This alternative would have impacts to visitor recreation use and experience as compared to recent historic usage (1966-1997). Instead of having access to the cave 52 weeks a year, this alternative allows for 44 weeks of access to portions of the cave each year. This alternative does not allow for visitor access to the entire cave, thus affecting the visitor experience of a portion of the natural, cultural, and historic elements of the cave. This alternative would allow for a healthy TBB colony. Thus, the evening programs focusing on bats (night hikes and bat viewing) could still provide visitor use and enjoyment. Additionally, the visitor experience of knowing that this colony exists and is protected would remain intact. The Balconies Caves would be open and accessible year-round, so a caving opportunity would be always be available.

Visitors would be able to experience a talus cave on their own, with their own sense of exploration. The cultural and historical qualities of the cave could also be shared through ranger-led programs, park guidebooks, virtual tours, or living history programs. Although these are not the same as experiencing the Robber's Room personally, there are ways to share the wonder of the cave without going into each cavity. However, if data collected from new bat surveys indicate that people were disturbing the bats, the visitor access would be decreased until the bats behave as they did during the 4-year study period (bat locations and bat activity).

Due to the long period of partial cave access, visitors would not need to carefully plan their visit around a brief cave opening and would be very likely to be able to experience the Bear Gulch Cave. This option would not meet the needs of visitors who want at least brief periods of full cave access. Because the open periods would be set each year, PNM would advertise when the cave would be opened on the voicemail system (831-389-4485), PNM webpage ([www.nps.gov/pinn](http://www.nps.gov/pinn)), and other communications. This would allow long distance travelers to plan their trips accordingly if they wished to experience the Bear Gulch Cave firsthand. Parking facilities are overtaxed even with the closure of the cave over the last four years. Visitation is limited by the existing parking, and opening the cave would not contribute to increased impacts to visitors. This would be a minor, long-term impact to visitor use and experience.

Water Quality: This alternatives requires construction of approximately 200 feet of new trail. This new section of trail may cause an increase in fine sediment into the stream during construction and possibly the first winter after construction while the trail is stabilizing. Erosion control devices (e.g. waddles, curlex) would be used as appropriate to contain sediment on site. Additionally, the trail would be built using wilderness trail construction techniques to Class III wilderness trail standards. These techniques minimize the amount of soil disturbance and thus minimize sedimentation potential. Using the above techniques should capture any potential sediment on site, thus having no significant impact to water quality in PNM.

In-stream work would proceed in as short a time as possible and would not affect the stream bottom. Additionally, in-stream work would be done during low flow or no flow periods, September 1 through October 30, when stream flow would be expected to be less than 10 cubic feet/second. Due the bedrock nature of the proposed construction site, an increase in sediment load introduced into the creek is not expected. During summer months, the surface flow of Bear Creek typically disappears entirely. There is a slight chance that water quality of Bear Creek may be temporarily affected by a small increase in sedimentation. Slight amounts of debris (dust, mortar, and similar small sized material) may periodically fall into the stream or stream channel. As possible, these would be cleaned up on site and will have no off site impacts. The infrequent events that cannot be cleaned up are expected to be small amounts of material that would quickly flush from the system and present no long term effects.

In the construction of gates, the only mechanized equipment to be used would be a generator, pun-jar (gas powered jackhammer), and torches. Fueling of all machinery would be conducted only in the equipment staging area and away from the creek. Any spills of hazardous materials, fuel, etc., would be cleaned up immediately, and would not be washed into the creek. Materials used for cleaning up fuel spills and other hazardous materials would be available on site.

This would be a negligible, short-term impact to water quality.

Cumulative Effects: TBB are declining throughout California. This alternative would not likely contribute to the decline of TBB within the park as access is managed. This would not likely threaten the long-term viability of this species throughout Central California.

#### **Alternative D**

This alternative is a combination of Alternatives B and C, and is the NPS preferred alternative. This alternative would allow cave access for 44 weeks of the year in the lower two-thirds of the cave and allow for full access of the cave 2-8 weeks a year, depending upon the biological timing of the bats. The construction of two new bat gates and a short connector trail would be required.

Vegetation: This alternative requires the removal of 6 holly-leaved cherry bushes and 1 coast live oak (less than 6 inches in diameter) and would require trimming of several shrubs related to the new connector trail. This alternative has a negligible, long-term impact on this resource and is not likely to lead to impairment of the vegetation.

Unique Ecosystems: Some concern has been raised over installing additional gates and the potential effects on the cave environment. While it is true that gates can affect the internal climate of a cave with few entrances, the Bear Gulch Cave has numerous skylights and openings. These gates will not affect the airflow, humidity, or other characteristics related to the cave's climate. This alternative has a negligible, long-term impact on this resource and is not likely to lead to impairment of the unique ecosystem.

Special Status Species: This alternative would potentially affect the TBB colony. Data from other colonies indicates that TBB can be sensitive to noise, and visitors in caves are inherently noisy. This alternative allows people in the cave during transition periods and hibernation. Transition periods are the time of year that the bats are least sensitive to human disturbance energetically. Additionally, data clearly indicates that the population of TBB drastically reduces in size during these times. If any visitor use during this period affected the TBB, it would be minor. However, the colony can be very sensitive during hibernation and during this period (late November through late February), the colony numbers are very high for this species (>250 individuals). There is a chance that noise from visitors in the lower portion of the cave will disturb the bats, potentially causing them to waken, use valuable fat stores, and

potentially starve to death due to decreased fat reserves. However, at this time park staff expects no significant impact to the bat colony associated with this alternative. Existing monitoring protocols would be continued to ensure that there is no significant impact to the colony. The impacts of this alternative would be the combination of the impacts identified in Alternatives B and C.

Monthly monitoring of the bats would continue. Data including bat locations, bat numbers, bat activity levels, and people activity levels would continue to be recorded. This new data would be compared to the baseline data collected over the past 3-4 years. If the new data indicates that the bats are not affected by visitor use, this alternative would continue to be implemented fully as planned. If the new data indicates that the bats are disturbed by people and are positively correlated with people activity, the visitor access would be decreased (and potentially stopped) until the bats behave as they did during the 4-year study period (bat locations and bat activity). Bat disturbance would be defined by the following data: changes in roost locations, decreases in bat numbers, and increases in bat activity (especially during the daylight hours). Following this mitigation may lead to very limited access of the cave, temporarily, in addition to the spatially limited access. This alternative would be a minor, long-term impact that would not likely lead to impairment.

Geologic Resources – Rocks and Streams: The construction of two new gates in the cave and a short (~200 ft) connecting trail have the potential of affecting geologic resources. The bolting of the gates into rock has the potential to affect the long-term weathering of the rocks. The construction of the gates would be in the stream channel. These gates have the potential of affecting high water flows ultimately causing debris jams.

To mitigate for these potential impacts, any bolts placed into the rock would be completely sealed with epoxy, preventing the possibility of water entering the rock via the drilled holes. The lower portion of Gate 1 (Fig. 1) would be designed with a hinge. This hinge would allow for the lower portion of the gate to be raised during high water, to allow debris to pass. After each high-water event, PNM staff would enter the cave and clear any debris from the gate (moving it to the downstream side of the gate). This alternative would have negligible, long-term impacts to the rocks and streams and would not likely lead to impairment.

Wilderness: Based upon 2 years of data collected during the current cave closure, the visitor use of wilderness areas did not exceed visitor levels that would impact the quiet and solitude qualities of wilderness (as defined in the 1997 Draft Wilderness Management Plan). Considering this alternative would allow for visitor use of the cave for the majority of the year, the visitor use of wilderness areas could be even less than during the study period. Therefore, this alternative is expected to have no impact to wilderness experiences or values and will not lead to impairment.

Cultural Resources: The gate construction would require some bolting into the trail bed. This bolting has the potential of affecting the historic integrity of the trail. At the two points where the gates would be constructed, the trail bed is concrete. The holes would need to be drilled into the trail bed to secure the gates. In both gate areas, there is CCC constructed handrail. These handrails are considered contributing features to the cultural resource and need to be protected. Views within the cave would be impacted by the gate construction.

To mitigate these potential impacts, any holes drilled into the trail bed can be sealed with epoxy, preventing further deterioration. If at some point in the future the gates were to be removed, the holes in the floor could be patched, and there would be no visual or structural damage to this historic feature of the trail. The gates have been designed in such a way as to keep the historic handrails in place, and gate construction would not affect the rails, so there would be no impact to the rails. The gates would be placed in such a way as to minimize the visual intrusion of the structures and maintain, as much as

possible, the historic viewshed within the chamber. With these mitigations, any potential impacts to cultural resources would be negligible and long-term but would not likely lead to impairment.

Visitor Recreation Use and Experience: This alternative would have impacts to visitor recreation use and experience as compared to recent historic usage (1966-1997). Instead of having access to the cave 52 weeks a year, this alternative allows 44 weeks of access to a portion of the cave each year, and 2-8 weeks of access to the entire cave each year, depending upon the bat annual cycle and influences of a given year's weather. This alternative allows visitor access to the entire cave for a portion of the year, thus allowing the complete cultural and historic elements of the cave to be experienced. Due to the long period of partial cave access, visitors would not need to carefully plan their visit around a brief cave opening and would be very likely to be able to experience the Bear Gulch Cave. This option would meet the needs of visitors who want to experience full cave access by planning for the brief open periods. However, if data collected from new bat surveys indicate that people were disturbing the bats, the visitor access would be decreased until the bats behave as they did during the 4-year study period (bat locations and bat activity). PNM would advertise when the cave would be opened on the voicemail system (831-389-4485), PNM webpage ([www.nps.gov/pinn](http://www.nps.gov/pinn)), and other communications.

This alternative would allow for a healthy TBB colony. The evening programs focusing on bats (night hikes and bat viewing) could still provide visitor use and enjoyment. Additionally, the visitor experience of knowing that this colony exists and is protected would remain intact. The Balconies Caves would be open and accessible year-round, so a caving opportunity would be always be available. Parking facilities are overtaxed even with the closure of the cave over the last four years. Visitation is limited by the existing parking, and opening the cave would not contribute to increased impacts to visitors. This alternative would have minor, long-term impacts to visitor use and experience.

Water Quality: This alternatives requires construction of approximately 200 feet of new trail. This new section of trail may cause an increase in fine sediment into the stream during construction and possibly the first winter after construction while the trail is stabilizing. Erosion control devices (e.g. waddles, curlex) would be used as appropriate to contain sediment on site. Additionally, the trail would be built using wilderness trail construction techniques to Class III wilderness trail standards. These techniques minimize the amount of soil disturbance and thus minimize sedimentation potential. Using the above techniques should capture any potential sediment on site, thus having no significant impact to water quality in PNM.

In-stream work would proceed in as short a time as possible and would not affect the stream bottom. Additionally, in-stream work would be done during low flow or no flow periods, September 1 through October 30, when stream flow would be expected to be less than 10 cubic feet/second. Due the bedrock nature of the proposed construction site, an increase in sediment load introduced into the creek is not expected. During summer months, the surface flow of Bear Creek typically disappears entirely. There is a slight chance that water quality of Bear Creek may be temporarily affected by a small increase in sedimentation. Slight amounts of debris (dust, mortar, and similar small sized material) may periodically fall into the stream or stream channel. As possible, these would be cleaned up on site and will have no off site impacts. The infrequent events that cannot be cleaned up are expected to be small amounts of material that would quickly flush from the system and present no long term effects.

In the construction of gates, the only mechanized equipment to be used would be a generator, pun-jar (gas powered jackhammer), and torches. Fueling of all machinery would be conducted only in the equipment staging area and away from the creek. Any spills of hazardous materials, fuel, etc., would be cleaned up immediately, and would not be washed into the creek. Materials used for cleaning up fuel spills and other hazardous materials would be available on site.

This would be a negligible, short-term impact to water quality.

Cumulative Effects: TBB are declining throughout California. This alternative would not likely contribute to the decline of TBB within the park as access is managed. This would not likely threaten the long-term viability of this species throughout Central California.

### **Alternative E**

This alternative closes the cave to all visitor access, thereby offering the greatest protection to the bats. Although this leaves the Balconies Cave as the only possible caving experience in the park, during the four year closure of the Bear Gulch Cave there has been no observed increase in impacts to the Balconies Cave. Subsequently, this is the environmentally preferred alternative.

Vegetation: This alternative would have no impact on vegetation.

Unique Ecosystems: This alternative would have a no impact on the unique ecosystem of the cave.

Special Status Species: This alternative would fully protect the Townsend's big-eared bat. There would be no impacts associated with special status species. Park biologists would continue to monitor the bat population to document numbers, locations, and activity status to determine the general health of the colony.

Geologic Resources – Rocks and Streams: This alternative would have no impacts associated with geologic resources.

Wilderness: Based upon 2 years of data collected during the current cave closure, the visitor use of wilderness areas did not exceed visitor levels that would impact the quiet and solitude qualities of wilderness (as defined in the 1997 Draft Wilderness Management Plan). Therefore, this alternative is not expected to have any impacts to wilderness experiences or values.

Cultural Resources: This alternative would have no impacts associated with cultural resources.

Visitor Recreation Use and Experience: This alternative would alter the recent historic use patterns of visitors within Pinnacles National Monument. From approximately 1966-1997, Bear Gulch Cave has been the primary visitor-use cave in PNM. It is estimated that 70-80% of the visitors who came to the east side of the park visited this cave. By denying visitor access, the visitor is denied the physical experience of enjoying the natural, cultural and historic elements of the cave.

When looking at the history of visitor use (1906-2001), the primary visitor use cave was the Balconies Cave. If this alternative were chosen, the Balconies Cave would remain open for visitor access, so there would still be a caving opportunity with PNM. Visitors would be able to experience a talus cave on their own, with their own sense of exploration. This alternative would allow for a healthy TBB colony. Thus, the evening programs focusing on bats (night hikes and bat viewing) could still provide visitor use and enjoyment. Additionally, the visitor experience of knowing that this colony exists and is protected would remain intact. The cultural and historical qualities of the cave can be shared through ranger-led programs, park guidebooks, virtual tours, or living history programs. Although these are not the same as experiencing a cave personally, there are ways to share the wonder of the cave without going inside. Parking facilities are overtaxed even with the closure of the cave over the last four years. Visitation is limited by the existing parking, and leaving the cave closed would not change impacts to visitors. This alternative would have major, long-term impacts to visitor use and experience.

Water Quality: This alternative would not impact water quality.

Cumulative Effects: TBB are declining throughout California. This alternative would not contribute to the decline of TBB within the park as there is no access. This would not threaten the long-term viability of this species throughout Central California.

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## **CONSULTATIONS/COORDINATION**

Park management began an internal discussion of management options beginning in June 1997. In October 1997, the management team decided to table discussions until experts had been consulted. In February 1998, PNM sponsored a Bat-Cave Working Group to discuss management options for PNM. From this meeting, a memorandum outlined a basic research protocol to begin to understand how the bats were using the cave and determine if visitors could use the cave without impairing the colony. During the 4-year study, PNM staff initiated public scoping meetings held in six cities surrounding PNM and passed out information at the visitor centers and park webpage, encouraging people to provide public comment. The comments were tabulated and park management and resource staff discussed a variety of management options presented by the public and provided by park staff. Each of these options was weighed comparing health of the bat colony and visitor access.

Consultation with the State Historic Preservation Officer has been completed for the proposed action. Archeological evaluation of the new trail has been completed. The U.S. Fish & Wildlife Service was contacted but no formal consultation was initiated as there are no listed threatened or endangered species present. A bat specialist with the California Department of Fish & Game was consulted in developing the alternatives.

### **Consultants**

Joel Despain, Cave Specialist  
NPS, Sequoia and Kings Canyon National Parks  
Cave Climate and Uses Issues



Leslie Kruger, Natural Resource Specialist  
NPS, Water Resources Division  
Wetland Management Impacts

Gary Smillee, Hydrologist  
NPS, Geologic Resources Division  
Floodplain Management Impacts

Chadwick A. Moore, Physical Scientist  
NPS, Pinnacles National Monument  
Air Quality Impacts, Geologic Impacts

Tom Leatherman, Chief of Research & Resource Management  
NPS, Pinnacles National Monument  
Vegetation Impacts

Lisa Smith, Trails Foreman  
NPS, Pinnacles National Monument  
Trail Design and Feasibility

Sam Edwards, Engineer  
Frontier Environmental Solutions  
Bat Gate Design and Impacts of Gates

Marsha Davis, Geologist  
NPS, Columbia Cascades Support Office  
Geologic Impacts

Judy Rocchio, Air Quality Specialist  
NPS, Pacific West Region Support Office  
Air Quality Impacts

Kimball Koch, Cultural Resources  
Robbyn Jackson, Historical Architect  
NPS, Pacific Great Basin Support Office  
Cultural Resources Consultation

Jonathan Bayless, Wildlife Biologist  
NPS, Pacific Great Basin Support Office  
Sensitive Species Issues

Richard Bañuelos, Interpretive Specialist  
NPS, Pinnacles National Monument  
Visitor Use and Experience Impacts

Betsy Bolster, Senior Wildlife Biologist  
California Department of Fish and Game

Jim Kennedy, Bat/Cave Specialist  
Bat Conservation International

Dixie Pierson, Bat Specialist

**Prepared by** Amy L. Fesnock, Wildlife Biologist, Pinnacles National Monument